

**ABSTRACT**

The invention provides a method and apparatus for densifying the teeth of a powder metal preform gear. The die includes an aperture for receiving a body of the gear and a plurality of grooves for receiving the teeth of the gear. The grooves have a length and a variable width along the length. The grooves narrow tangentially relative to the aperture. The powder metal preform gear is urged through the die and the teeth are plastically and elastically deformed at a relatively narrow portion of the groove. After passing through the narrow portion of the groove and being compressed, the teeth can at least partially recover. The grooves defined by the die can be helical for forming a helical groove.